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Volume 1

**PROCEEDINGS of the
19th DOE/NRC NUCLEAR AIR
CLEANING CONFERENCE
Held in Seattle, Washington
18-21 August 1986**

Sponsors: U.S. Department of Energy

**Office of Assistant Secretary for
Environment, Safety, and Health**

U.S. Nuclear Regulatory Commission

**Office of Nuclear Reactor Regulation
Office of Nuclear Regulatory Research**

The Harvard Air Cleaning Laboratory

**Editor
Melvin W. First**

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May 1987**

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19th DOE/NRC NUCLEAR AIR CLEANING CONFERENCE

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19th DOE/NRC NUCLEAR AIR CLEANING CONFERENCE

FOREWORD

The Nineteenth DOE/NRC Nuclear Air Cleaning Conference was held in Seattle, Washington, on August 18-21, 1986, under the sponsorship of the U.S. Department of Energy (DOE), the U.S. Nuclear Regulatory Commission (NRC), and the Harvard Air Cleaning Laboratory. A total of 247 air-cleaning specialists attended, representing the United States, West Germany, Canada, Japan, England, France, Italy, Austria, Belgium, Israel, Korea, The Netherlands, Republic of China, and Sweden. Those attending were affiliated with government agencies, educational institutions, national laboratories, and numerous private sectors of the nuclear industry.

Those familiar with prior Air Cleaning Conferences will be aware that the U.S. Nuclear Regulatory Commission was, for the first time, a sponsor of an Air Cleaning Conference. Originally sponsored by the U.S. Atomic Energy Commission (through the 13th Conference), responsibility for these Conferences was allocated first, to the Energy Research and Development Administration (14th Conference) and then to the successor agency, the U.S. Department of Energy (15th to 18th Conferences), after the U.S.A.E.C. was terminated. Although the NRC was not an official sponsor of the 14th through 18th Conferences, personnel from this agency continued to participate in all phases of the Conferences, from serving on the Program Committee to recruiting speakers, chairing sessions, and providing a significant portion of the technical presentations. Therefore, the 19th Conference has special significance in that it marks the first time the two successor agencies of the U.S.A.E.C. have joined forces to sponsor a Nuclear Air Cleaning Conference. In celebration of this event, the official title of the Conference has been returned to its origins and is again called the Air Cleaning Conference. Nevertheless, the interests of the DOE in nuclear airborne waste treatment and disposal remained undiminished, and the 19th Conference continues to feature discussions of this topic.

The conference proceedings show that over the past few years air cleaning research has been directed primarily to the analysis and critique of existing systems, with operational assessment and the potential impact of new source terms in the forefront. Significant effort has been devoted to the development and revision of U.S. standards and regulations. In European countries, researchers continue to stress air-cleaning problems associated with spent fuel reprocessing, whereas U.S. concerns are more in areas of fire detection, prevention, and elimination, and in the operation of control room habitability systems.

Meetings of this size and complexity require the dedicated service and wise counsel of many. The Chairman of the 19th DOE/NRC Nuclear Air Cleaning Conference wishes to record his appreciation of the firm support and willing assistance provided by the entire Program Committee throughout the lengthy planning process and during the Conference, itself. The committee names are displayed on page

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ii. Special mention is due to Mr. Robert Kratzke, U.S. DOE, and Mr. Charles Willis, U.S. NRC, both members of the Program Committee, who were the designated representatives of their sponsoring agencies and who loyally and effectively served the interests of the Conference without neglecting in any way their responsibility to their own agencies. Administrative support for the Conference and preparation of the Proceedings was ably provided by Mrs. Joan K. Sullivan at the Harvard School of Public Health who has earned the Chairman's heartfelt and sincere thanks for a difficult job cheerfully and very well done.

Melvin W. First
Conference Chairman

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